

A RESEARCH ON STUDENTS' UNIVERSITY AND PROGRAM PREFERENCE CRITERIA

Mustafa AĞAOĞLU¹, E.Serra YURTKORU²,

¹Marmara Üniversitesi, Mühendislik Fakültesi, Öğretim Üyesi, Yrd. Doç. Dr.

²Marmara Üniversitesi, İşletme Fakültesi, Öğretim Üyesi, Doç. Dr.

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Abstract: This research was conducted to understand university and program preference criteria used by students and to find out differences in preference criteria with regard to students' study areas, academic units, education type, language of instruction and gender. Sample of the study was consisted of 2216 students from Marmara University. Results revealed that students use five university preference criteria; "Social & Sports Activities," "International Recognition & Research Opportunities," "Reputation of the University," "Family & Friends," "State University & Low Tuition" and four program preference criteria; "Area of Interest," "Research Opportunities," "Score, Family & Friends," "Reputation of the Department & Job Opportunities." The most important criteria used by the students in university and program preference were "State University & Low Tuition" and "Area of Interest" respectively. Results also showed that there were statistical differences with regard to study areas, academic units, education type, and language of instruction as expected however, no differences were found among genders.

Keywords: Higher Education, University Preference Criteria, Program Preference Criteria.

I. INTRODUCTION

Globalization and technological developments have affected the education area like all other markets. Students are now faced with numerous local, global, or distance programs and institutions to choose from. Higher education institutions, faced with fierce competition, must distinguish themselves to remain competitive, and screen applicants to ensure they obtain the most desirable students – who are likely to succeed – from around the world [1,2]. To develop effective strategies and policies to attract a large pool of qualified applicants, higher education institutions should design appropriate programs to meet the target markets' needs, and they should identify the factors that influence applicants' higher education institution choice.

I.1. University Preference Criteria

University preference criteria have been studied in the US literature for several decades due to declining demand for higher education and decreasing funding grants [3,4]. As a result of inter-university competition and rising levels of tuition fees, investigation of the criteria in selecting a university is gaining an increasing

ÖĞRENCİLERİN ÜNİVERSİTE VE PROGRAM TERCİH ÖLÇÜTLERİ ÜZERİNE BİR ARAŞTIRMA

Özet: Bu araştırma öğrencilerin üniversite ve program tercih ölçütlerini belirlemek ve öğrencilerin çalışma alanına, akademik birimine, eğitim türüne, diline, ve cinsiyetine göre tercih ölçütlerinin farklılık gösterip göstermediğini ortaya koymak amacıyla yapılmıştır. Çalışmada örnek olarak 2216 Marmara Üniversitesi öğrencisi kullanılmıştır. Sonuçlar öğrencilerin beş üniversite tercih ölçütü; "Sosyal ve Sportif Etkinlikler", "Uluslararası Tanınmışlık ve Araştırma Olanakları", "Üniversitenin İtibarı", "Aile ve Arkadaşlar", "Devlet Üniversitesi ve Düşük Eğitim Maaliyeti" ve dört de program tercih ölçütü; "İlgi Alanı", "Araştırma Olanakları", "Puan, Aile ve Arkadaşlar", "Bölümün İtibarı ve İş Olanakları" kullandığını ortaya koymuştur. Öğrencilerin en önem verdiği ölçütler "Devlet Üniversitesi ve Düşük Eğitim Maaliyeti" ve "İlgi Alanı" olarak bulunmuştur. Bulgular ayrıca tercih ölçütlerinin, öğrencinin çalışma alanına, akademik birimine, eğitim türüne ve diline göre istatistiksel olarak anlamlı farklılıklar gösterdiğine işaret etmektedir, ancak cinsiyete göre anlamlı bir farklılık bulunmamıştır.

Anahtar Kelimeler: Yükseköğretim, Üniversite Tercih Ölçütleri, Program Tercih Ölçütleri.

attention in other countries like Australia and the UK as well [1,3]. Many higher education institutions perceived transnational education as a primary solution to their financial difficulties, and these English speaking countries, as the main exporters of international education, has shifted their investigation on significant determinants of university choice process to the international students [5,6,7].

Previous research on university preference criteria of applicants, either local or international, has shown that student choice is subject to multiple influences and there are conflicting findings as to which factors are most influential [1,5]. Nevertheless, the key factors that are common to most studies are reputation or prestige of university and/or program, tuition and availability of financial aid, geographic location, influence of others or family legacy, area of interest, and extracurricular opportunities like sport facilities, social life in the campus and nearby [3,4,8,9]. Previous research also suggests that it is likely that prospective students make university decisions on incomplete information and base their evaluation on a limited number of key criteria [5].

I.2. Turkish Setting

Unlike these other countries, Turkey is not faced with declining student numbers. In last ten year period, the number of students enrolled to educational institutions for undergraduate education increased approximately 2.4 times from 150,000 to 360,000 [10,11]. However, while the number of universities was 27 in 1982 (all state), today this number has reached to 188 (103 state and 65 private universities, 7 private vocational schools, 13 other higher education institutions). In addition to this increase in the number of universities, there is also an increase in the internationalization of higher education [12,13]. Therefore, Turkish universities have to compete not only with the local state and private universities but also with the global universities.

Another challenge for Turkish higher education institutions is that students for undergraduate programs of the universities are selected and placed by a centrally administered examination system. The Student Selection and Placement Center “selects and places students with the highest probability of success in all the available education programs, taking into consideration their preferences, and performance on the university entrance exams” [14]. Therefore, Turkish universities do not have a chance to apply a recruitment process to screen applicants; rather they need to convince qualified candidates to prefer their universities. Consequently, knowing which criteria candidates for Turkish universities

use while determining their preferences would give valuable insights to universities. Universities can use these criteria to inform and persuade qualified students to choose their programs.

Previous studies conducted suggests even though the university entrance system is different in Turkey, students’ university preference criteria are in line with the literature [15,16]. Their exploratory factor analyses results revealed “social & sports activities and IT infrastructure,” “international recognition & exchange,” “area of interest,” “state university & low tuition,” “place & convenience,” and “family & friends” as university preference criteria.

Understanding the selection criteria students use to evaluate higher education institutions is a helpful tool for the institutions to communicate appropriately and influence the selection process [7]. Especially in the Turkish setting, where the higher education institutions cannot apply their own recruitment process and have to wait candidates to prefer their organizations passively, communicating the right message to attract qualified students gains even more importance. Consequently, this study aims to further analyze the key determinants that students use to make their decision on higher education institutions. To get more insights, university and program preference criteria will be developed separately. Later, it will be also analyzed if preference criteria differ with regard to students’ study areas, academic units, education type, language of instruction and gender.

Table 1. Descriptive Information on Sample by Academic Units, Education Type, Gender, & Language of Instruction

Academic Units	Education Type		Gender		Language of Instruction		Total
	Regular	Evening	Female	Male	Turkish	Foreign Language	
Faculty	1246	550	1089	707	1470	326	1796
Schools	54	49	57	46	103	-	103
Vocational Schools	185	132	183	134	317	-	317
Total	1485	731	1329	887	1890	326	2216

II. METHODOLOGY

II.1. Sample

Data for this study are collected from freshman students who are enrolled to 13 faculties, 3 schools, and 5 vocational schools in a state university located in Istanbul, Turkey. 20% of the students are chosen using proportional stratified sampling. The sample consists of 2216 students, 60% females, and 40% males. Sample’s frequency distribution by academic units is 81% faculty, 5% school, 14%, and vocational school. 85% of the students are enrolled to programs where the language of instruction is in Turkish, and 15% of the students are enrolled to programs where the language of instruction is in a foreign language (English, French, or German). Also 33% of the sample is enrolled to evening education and the rest 67% to regular education (See Table 1).

Table 2. Frequency Distribution of Study Areas

Study Areas	Frequency
Education	353
Engineering	124
Health Sciences	229
Law	178
Linguistics	179
Science	100
Social, Human and Administrative Sciences	742
Theology	191
Vocational and Technical Education	120
Total	2216

Students’ study areas are given in Table 2. As can be seen from the table there is a variety of study areas: “Education,” “Engineering,” “Health Sciences,” “Law,” “Linguistics,” “Science,” “Social, Human and Administrative Sciences,” “Theology,” and “Vocational and Technical Education.” Frequency distribution by

study areas is 16%, 6%, 10%, 8%, 8%, 5%, 33%, 9%, and 5% respectively.

II.2. Instrument

Instruments used in this study to gather data are University Preference Criteria Questionnaire and Program Preference Criteria Questionnaire, which are developed based on literature. University Preference Criteria Questionnaire has 19 items and Program Preference Criteria Questionnaire has 11 items. Students are asked to evaluate “to what degree they used each of these criteria

while they were making their decision” on a five point scale, where “not at all” equals 1 and “definitely” equals 5 for both questionnaires.

II.3. Data Collection

Using a data mining model data fields were described and the database for this data was modeled and implemented on a database server. Web interphases were developed on which the questionnaire was conducted on the Internet. The data was cleaned, integrated, reformatted, and prepared for various statistical analyses.

Table 3. Exploratory & Confirmatory Factor Analyses Results of The University Preference Criteria Questionnaire

Factors	EFA loadings	CFA loadings	t value
Social & Sports Activities (VE=19.20; α =0.90; CR=0.90; AVE=0.69)			
Social activities	0.84	0.89	29.25□□□
Student clubs	0.81	0.89	29.26□□□
Sport activities	0.71	0.80	26.08□□□
Campus security	0.54	0.73	<i>a</i>
International Recognition & Research Opportunities (VE=17.93; α =0.89; CR=0.89; AVE=0.62)			
International recognition	0.78	0.85	30.98□□□
International programs	0.63	0.78	27.75□□□
Job opportunities for graduates	0.61	0.73	25.60□□□
IT infrastructure	0.59	0.80	28.63□□□
Research opportunity	0.57	0.78	<i>a</i>
Reputation of the University (VE=12.30; α =0.95; CR=0.94; AVE=0.88)			
Reputation of the University	0.83	0.96	45.38□□□
Image of the University	0.79	0.92	<i>a</i>
Family & Friends (VE=8.55; α =0.63; CR=0.64; AVE=0.48)			
Families' choice	0.69	0.80	<i>a</i>
Friends' choice	0.56	0.56	12.34□□□
State University & Low Tuition (VE=8.44; α =0.67; CR=0.69; AVE=0.52)			
Lower cost of education	0.71	0.68	<i>a</i>
State university	0.62	0.77	15.27□□□
(KMO=0.91, χ^2 Bartlett test (105)=10881.99; <i>p</i> value=0.00)			
χ^2 (80, N=1120)=591.43, <i>p</i> value=0.00; GFI=0.93; AGFI=0.90; CFI=0.95; RMSEA=0.08			

Note. α = Cronbach's Reliability; VE= Variance Explained; CR= Construct Reliability; AVE=Average variance extracted; *a*=scale item fixed to 1, GFI= Goodness of Fit Index; AGFI= Adjusted Goodness of Fit Index, CFI= Comparative Fit Index; RMSEA= Root Mean Square Error Approximation □ $p < 0.05$; □□ $p < 0.01$; □□□ $p < 0.001$

III. FINDINGS

III.1. Initial Analysis

University Preference and Program Preference Criteria Questionnaires are newly developed instruments therefore to identify and understand the underlying structure of the questionnaires, exploratory factor analysis (EFA) was planned as the initial step. However, it is necessary to confirm the new component structures established through EFA, and using the same data set would erroneously increase the fit measures, therefore separate data sets for model building and validation is used as recommended by Lattin, Carroll, and Green [17]. By random sampling technique with Bernoulli distribution, the data set is divided into half [18]. As a result, our analysis sample for conducting EFA consisted of 1096 observations and holdout sample for conducting

confirmatory factor analysis (CFA) consisted of 1120 observations.

Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett test of sphericity tests are performed to test the appropriateness of data for conducting factor analyses [19]. Then principal component factoring and varimax rotation are employed to the data set. Factors with eigenvalues over one are retained and items with high cross loadings are excluded [18,20]. Five items are trimmed from the University Preference Criteria Questionnaire, and the fifteen items converged into five factors with 66.41% explained variance (KMO=0.91, χ^2 Bartlett test (105)=10881.99, *p*=.00). Factors are named as “social & sports activities,” “international recognition and research opportunities,” “reputation of the university,” “family and friends,” “state university and low tuition.” To test the internal consistency of factors, Cronbach's coefficient alpha

reliabilities are computed. Reliabilities for factors are 0.90, 0.89, 0.95, 0.63, and 0.67 respectively. Nunnally [21] suggests a value of 0.70 as lower limit, but it can decrease to 0.60, in addition, there is a positive relation between alpha coefficient and the number of items [18, 22].

In the Program Preference Criteria Questionnaire one item is trimmed, and the ten items converged into

four factors with 74.69% explained variance (KMO=0.84, χ^2 Bartlett test (45)=4316.35, $p=.00$). Factors are named as “area of interest,” “research opportunities,” “score, family & friends,” and “reputation of the program & job opportunities.” To test the internal consistency of factors, Cronbach’s coefficient alpha reliabilities are computed. Reliabilities for factors are 0.84, 0.78, 0.66, and 0.73 respectively.

Table 4. Exploratory & Confirmatory Factor Analysis Results of the Program Preference Criteria Questionnaire

Factors	EFA loadings	CFA loadings	t value
Area of Interest (VE=21.09; α =0.84; CR=0.85; AVE=0.74)			
Interest in area	0.89	0.89	24.73***
Interest in department	0.89	0.83	<i>a</i>
Research Opportunities (VE=18.20; α =0.78; CR=0.77; AVE=0.53)			
Laboratories/ Ateliers	0.89	0.65	19.26***
Research opportunity	0.69	0.82	23.05***
Having known instructors	0.59	0.72	<i>a</i>
Score, Family & Friends (VE=17.80; α =0.66; CR=0.66; AVE=0.41)			
University entrance exam score	0.80	0.43	11.93***
Friends’ choice	0.77	0.64	15.73***
Families’ choice	0.65	0.80	<i>a</i>
Reputation of the Department & Job Opportunities (VE=17.60; α =0.73; CR=0.77; AVE=0.63)			
Job opportunities for graduates	0.88	0.70	21.40***
Prestige of the department	0.72	0.88	<i>a</i>
(KMO=0.84, χ^2 Bartlett test (45)=4316.35; p value=0.00)			
χ^2 (29, N=1120)=309.58 p value=0.00; GFI=0.95; AGFI=0.90; CFI=0.94; RMSEA=0.08			

Note. *a* = Cronbach’s Reliability; VE= Variance Explained; CR= Construct Reliability; AVE=Average variance extracted; *a*=scale item fixed to 1, GFI= Goodness of Fit Index; AGFI= Adjusted Goodness of Fit Index, CFI= Comparative Fit Index; RMSEA= Root Mean Square Error Approximation * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Then confirmatory factor analyses (CFA) is conducted to verify factor structures. Chi-square test statistics are usually quite sensitive to sample size [18,23]. Therefore, in this study, Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Comparative Fit Index (CFI), and Root Mean Square Error Approximation (RMSEA) are considered. There is no standard for acceptable fit indices, but the rules of thumb are values greater than 0.90 for GFI and CFI, values greater than 0.85 for AGFI, and values of .08 and less for RMSEA [18,22]. Fit indices for the CFA suggested good fit for University Preference and Program Preference Criteria factor structures (χ^2 (80, N=1120)=591.43, $p=.00$, GFI=0.93, AGFI=0.90, CFI=0.95, RMSEA=0.08, and χ^2 (29, N=1120)=309.58, $p=.00$, GFI=0.95, AGFI=0.90, CFI=0.94, RMSEA=0.08 respectively).

Finally, procedures to check for convergent and discriminant validity are employed. All factor loadings are relatively high and significant, providing evidence for convergent validity [24]. Construct reliabilities of 0.90, 0.89, 0.94, 0.64, and 0.69 for University Preference Criteria and 0.85, 0.77, 0.66, and 0.77 for Program Preference Criteria indicated high internal consistency of the dimensions [18,20].

Another measure of reliability is the average variance extracted (AVE) which reflects the overall amount of variance accounted for by the latent construct. Fornell and Larcker [25] favors level of 0.50 or above,

but for new scales values more than 0.45 seems reasonable [20]. As can be seen from Table 3 and Table 4 except for one factor all the AVEs were above .45 threshold. To assess the discriminant validity of the scales we first checked the Fornell and Larcker [25] criterion where the discriminant validity is established when the AVE for the two constructs is greater than the squared correlation between the two constructs. Then we constrained parameter estimate for the two constructs to unity and compared with factor model where parameter is freely estimated [26]. For each pair the constrained CFA produced an increase in the chi-square statistic ($\Delta\chi^2$ with 1 df) that was significant at $p<.01$. Findings supported both the convergent and discriminant validity consequently the distinctness of the constructs. Therefore, it is decided to keep the factor, “score, family & friends,” for further analyses.

EFA and CFA supported the distinctiveness of University Preference and Program Preference Criteria Questionnaires’ dimensions. Later the summated scores of these dimensions are calculated and new variables are formed. The whole data set is used for further analyses.

III.2. Final Analysis

Finding out underlying factors is not enough to specify which factors are favored or used more by students, while they were making their university and program choice. Therefore, we conducted Friedman two-way analysis of variance by ranks test to reveal the

differences between ratings given to preference criteria (See Table 5). The result of the Friedman analysis indicate that during university preference “state university & low tuition” and “reputation of the university” are the two most important criteria used by the students, which are followed by “international recognition & research opportunities” and “social & sports activities.” The least important criterion is “family & friends.” The result of the Friedman analysis for the program preference indicates that the most important criteria are “area of interest” which is then followed by “reputation of the department & job opportunities” and “research opportunities.” Like in the university preference, the least used criterion is “score, family, and friends.”

Previous studies has shown that key determinants that students use to make their decision on university preferences in Turkish setting differs by students’ academic unit (faculty, school, vocational school), study area (science, social sciences, and health sciences), language of instruction and gender [15,16]. Therefore, we further analyzed the five university and four program preference criteria with respect to students’ academic units, language of instruction, education type, and gender.

Table 5. Result of Friedman Two-Way Analysis of Variance

University Preference Criteria	Mean rank
State University & Low Tuition	3.65
Reputation of the University	3.59
International Recognition & Research Opportunities	2.95
Social & Sports Activities	2.52
Family & Friends	2.29
Program Preference Criteria	Mean rank
Area of Interest	3.17
Reputation of the Department & Job Opportunities	2.74
Research Opportunities	2.15
Score, Family & Friends	1.94

χ^2 Friedman test (5, N=2216)=1739.28, p=0.00

χ^2 Friedman test (4, N=2216)=1604.74, p=0.00

Independent sample t-test results indicate that there is no significant difference in selection criteria used by students according to their gender. However, there are significant differences by language of instruction and education type (See Table 6 and 7).

Table 6. Results of Independent Sample t-tests: Comparisons by Language of Instruction

		n	Mean	Std. Dev.	t value	d.f.	p value																																																																																
Social & Sports Activities	T	1890	3.80	1.03	5.21	2214	.00□□																																																																																
	FL	326	3.48	1.03				International Recognition & Research Opportunities	T	1890	4.04	0.91	3.17	2214	.00□□	FL	326	3.86	0.87	Reputation of the University	T	1890	4.35	0.88	5.54	2214	.00□□	FL	326	4.06	0.97	Family & Friends	T	1890	3.53	1.20	5.66	2214	.00□□	FL	326	3.12	1.15	State University & Low Tuition	T	1890	4.39	0.85	3.46	423.74	.00□□	FL	326	4.20	0.93	Research Opportunities	T	1890	3.76	1.01	2.50	2214	.01□	FL	326	3.61	0.99	Score, Family & Friends	T	1890	3.51	1.12	5.75	465.68	.00□□	FL	326	3.15	1.04	Reputation of the Department & Job Opportunities	T	1890	4.09	0.97	-2.01	2214	.04□
International Recognition & Research Opportunities	T	1890	4.04	0.91	3.17	2214	.00□□																																																																																
	FL	326	3.86	0.87				Reputation of the University	T	1890	4.35	0.88	5.54	2214	.00□□	FL	326	4.06	0.97	Family & Friends	T	1890	3.53	1.20	5.66	2214	.00□□	FL	326	3.12	1.15	State University & Low Tuition	T	1890	4.39	0.85	3.46	423.74	.00□□	FL	326	4.20	0.93	Research Opportunities	T	1890	3.76	1.01	2.50	2214	.01□	FL	326	3.61	0.99	Score, Family & Friends	T	1890	3.51	1.12	5.75	465.68	.00□□	FL	326	3.15	1.04	Reputation of the Department & Job Opportunities	T	1890	4.09	0.97	-2.01	2214	.04□	FL	326	4.21	0.85								
Reputation of the University	T	1890	4.35	0.88	5.54	2214	.00□□																																																																																
	FL	326	4.06	0.97				Family & Friends	T	1890	3.53	1.20	5.66	2214	.00□□	FL	326	3.12	1.15	State University & Low Tuition	T	1890	4.39	0.85	3.46	423.74	.00□□	FL	326	4.20	0.93	Research Opportunities	T	1890	3.76	1.01	2.50	2214	.01□	FL	326	3.61	0.99	Score, Family & Friends	T	1890	3.51	1.12	5.75	465.68	.00□□	FL	326	3.15	1.04	Reputation of the Department & Job Opportunities	T	1890	4.09	0.97	-2.01	2214	.04□	FL	326	4.21	0.85																				
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T = Turkish, FL = Foreign Language; □ p < 0.05; □□ p < 0.01

Table 7. Results of Independent Sample t-tests: Comparisons by Education Type

		n	Mean	Std. Dev.	t value	d.f.	p value																																												
Social & Sports Activities	I	1485	3.69	1.04	-4.19	2214	0.00□□																																												
	II	731	3.88	1.01				Reputation of the University	I	1485	4.27	0.92	-2.83	1580.7	0.00□□	II	731	4.38	0.84	Family & Friends	I	1485	3.36	1.21	-6.07	2214	0.00□□	II	731	3.69	1.16	State University & Low Tuition	I	1485	4.34	0.90	-1.98	1636.3	0.04□	II	731	4.41	0.79	Score, Family & Friends	I	1485	3.37	1.13	-5.11	1529.7	0.00□□
Reputation of the University	I	1485	4.27	0.92	-2.83	1580.7	0.00□□																																												
	II	731	4.38	0.84				Family & Friends	I	1485	3.36	1.21	-6.07	2214	0.00□□	II	731	3.69	1.16	State University & Low Tuition	I	1485	4.34	0.90	-1.98	1636.3	0.04□	II	731	4.41	0.79	Score, Family & Friends	I	1485	3.37	1.13	-5.11	1529.7	0.00□□	II	731	3.62	1.07								
Family & Friends	I	1485	3.36	1.21	-6.07	2214	0.00□□																																												
	II	731	3.69	1.16				State University & Low Tuition	I	1485	4.34	0.90	-1.98	1636.3	0.04□	II	731	4.41	0.79	Score, Family & Friends	I	1485	3.37	1.13	-5.11	1529.7	0.00□□	II	731	3.62	1.07																				
State University & Low Tuition	I	1485	4.34	0.90	-1.98	1636.3	0.04□																																												
	II	731	4.41	0.79				Score, Family & Friends	I	1485	3.37	1.13	-5.11	1529.7	0.00□□	II	731	3.62	1.07																																
Score, Family & Friends	I	1485	3.37	1.13	-5.11	1529.7	0.00□□																																												
	II	731	3.62	1.07																																															

I = Regular education, II = Evening education; □ p < 0.05; □□ p < 0.01

Students, who are enrolled to programs where the language of instruction is in Turkish, perceive all five dimensions of university preference criteria more important in their decisions than students who are enrolled to programs where the language of instruction is in foreign language. When we examined independent sample t test results for program preference criteria, we found out that there is no significant difference for “area of interest” criterion. However students who are enrolled to programs where the language of instruction is in foreign language found “reputation of the department & job opportunities” more important in their program choice than students who are enrolled to programs where the teaching medium is in Turkish (mean_T=4.09, mean_{FL}=4.21 t=-2.01, p=0.00). On the other hand, students in Turkish teaching programs found “research opportunities” and “score, family & friends” more important in their program choice (mean_T=3.76, mean_{FL}=3.61 t=2.50, p=0.00; mean_T=3.51, mean_{FL}=3.15 t=5.75, p=0.00 respectively).

When we compared the dimensions of preference criteria by students’ education type, we found that except for the “international recognition & research opportunities” which is insignificant, students enrolled to evening education finds all other dimensions of university preference criteria more important in their university choices. When we analyzed the independent sample t test results for the program preference criteria by education type, only significant result was “score, family & friends” which was again more important for students enrolled to evening education in program choice (mean_R=3.37, mean_E=3.62 t=-5.11, p=0.00).

To test if the importance given to preference criteria differed by students’ academic unit and study area, we planned to conduct one-way ANOVA analyses. However, our data set did not meet the assumption of homogenous variances; therefore, we performed a series of Welch and Brown – Forsythe tests.

Table 8. Results of Welch and Brown-Forsythe Tests: Comparisons by Academic Units

	Means			Test statistics		
	F	S	VS	Welch	Brown Forsythe	p value
	n=1796	n=317	n=103			
Social & Sports Activities	3.69	4.01	4.02	19.16	19.68	0.00□□
Family & Friends	3.40	3.51	3.85	21.50	20.18	0.00□□
Research Opportunities	3.72	3.46	3.89	7.45	7.47	0.00□□
Score, Family & Friends	3.39	3.39	3.86	28.67	26.09	0.00□□

F = Faculty, S = School, VS = Vocational School; □ p < 0.05; □□ p < 0.01

Table 9. Results of Welch and Brown-Forsythe Tests: Comparisons by Study Areas

	Means										Test statistics		
	ED	SC	LN	L	TH	VT	E	H	S	Welch	Brown Forsythe	p value	
	n=353	n=100	n=179	n=178	n=191	n=120	n=124	n=229	n=742				
Social & Sports Activities	3.81	3.84	3.72	3.61	3.54	4.06	3.65	3.65	3.80	3.52	3.79	0.00□□	
Reputation of the University	4.38	4.28	4.29	4.30	4.42	4.20	4.01	4.17	4.37	3.49	3.56	0.00□□	
Family & Friends	3.50	3.39	3.32	3.59	3.72	3.91	3.05	3.35	3.44	6.55	6.22	0.00□□	
State University & Low Tuition	4.42	4.38	4.41	4.28	4.18	4.42	4.19	4.33	4.42	2.10	2.51	0.00□□	
Area of Interest	4.38	4.49	4.61	4.68	4.55	4.35	4.46	4.38	4.37	6.10	4.68	0.00□□	
Research Opportunities	3.59	4.01	3.51	3.69	3.87	4.03	3.88	3.96	3.65	7.30	7.42	0.00□□	
Score, Family & Friends	3.50	3.32	3.23	3.65	3.76	3.91	3.17	3.50	3.34	8.77	8.62	0.00□□	
Reputation of the Dept. & Job Opportunity	4.00	3.88	3.92	4.52	3.97	4.08	4.24	4.34	4.09	12.58	9.36	0.00□□	

ED = Education, SC = Science, LN = Linguistics, L = Law, TH = Theology, VT = Vocational and Technical Education, E = Engineering, H = Health Sciences, S = Social, Human and Administrative Sciences; □ p < 0.05; □□ p < 0.01

As can be seen from Table 8, there are significant differences in importance given to “social & sport activities” and “friends & family” by academic units. Tamhane’s multiple comparison test revealed that students enrolled to schools and vocational schools find “social & sport activities” more important in their university choices than students enrolled to faculties and students enrolled to vocational schools find “friends & family” more important in their university choices compared to students enrolled to faculties and schools

(mean_F=3.69, mean_S=4.01, mean_{VS}=4.02, Welch test=19.16, Brown-Forsythe test= 19.68, p=0.00; mean_F=3.40, mean_S=3.51, mean_{VS}=3.85, Welch test=21.50, Brown-Forsythe test= 20.18, p=0.00 respectively). In program preference “research opportunities” is not as much important to students enrolled to schools as students enrolled to faculties and vocational schools and “score, family & friends” is a more important criterion for students enrolled to vocational schools (mean_F=3.72, mean_S=3.46,

mean_{VS}=3.89, Welch test=7.45, Brown-Forsythe test=7.47, p=0.00; mean_F=3.39, mean_S=3.39, mean_{VS}=3.86, Welch test=28.67, Brown-Forsythe test= 26.09, p=0.00 respectively). The other dimensions were not statistically significant.

When we conducted Welch and Brown-Forsythe tests to analyze the differences in importance given to preference criteria by students in various study areas we found that except for “international recognition & research opportunities” all dimensions were significant (See Table 9). To find out where the differences come from Tamhane’s multiple comparison tests were applied. The results indicated “Social & Sports Activities” is more important for *Vocational and Technical Education* than *Theology* and *Law* (mean_{VT}=4.06, mean_{TH}=3.54, mean_L=3.61, Welch test=3.52, Brown-Forsythe test=3.79, p=0.00); “Reputation of the University” is more important for *Theology*, *Education* and *Social, Human and Administrative Sciences* than *Engineering* (mean_{TH}=4.42, mean_{ED}=4.38, mean_S=4.37, mean_E=4.01, Welch test=3.49, Brown-Forsythe test= 3.56, p=0.00); “Family & Friends” is more important for *Vocational and Technical Education* than *Education, Science, Linguistics, Health Sciences, Social, Human and Administrative Sciences* and *Engineering* and less important for *Engineering* than *Education, Law, Theology, Social, Human and Administrative Sciences* and *Vocational and Technical Education* (mean_{VT}=3.91, mean_{ED}=3.50, mean_{SC}=3.39, mean_{LN}=3.59, mean_{HS}=3.39, mean_H=3.35, mean_E=3.05; mean_L=3.59, mean_{TH}=3.72, Welch test=6.55, Brown-Forsythe test= 6.22, p=0.00).

“State University & Low Tuition” is significant yet multiple comparison tests could not reveal from which groups these difference came from.

When dimensions for program preferences were analyzed it is found that “area of interest” is a more

important criterion for *Law* students than *Vocational and Technical Education, Social, Human and Administrative Sciences, Health Sciences,* and *Education* students and again “area of interest” is a more important criterion for *Linguistics* students than students of *Social, Human and Administrative Sciences* (mean_L=4.68, mean_{VT}=4.35, mean_S=4.37, mean_H=4.38, mean_E=4.38, Welch test=6.10, Brown-Forsythe test= 6.68, p=0.00).

“Research Opportunities” is equally important for *Vocational and Technical Education, Science and Health Sciences* and students of these three study areas find “Research Opportunities” more important than *Social, Human and Administrative Sciences, Education,* and *Linguistics* students, linguistic students finding the dimension least important (mean_{VT}=4.03, mean_{SC}=4.01; mean_H=3.96, mean_S=3.65, mean_{LN}=3.51, Welch test=7.30, Brown-Forsythe test= 7.42, p=0.00).

“Score, Family & Friends” is perceived equally by *Vocational and Technical Education, Theology,* and *Law* and has more importance than students of study areas *Engineering, Linguistics, Science* and *Social, Human and Administrative Sciences*. The last four also perceives the importance of this dimension equally (mean_{VT}=3.91, mean_{TH}=3.76; mean_L=3.65, mean_E=3.17 mean_{LN}=3.23, mean_{SC}=3.32, mean_S=3.34, Welch test=8.77, Brown-Forsythe test= 8.62, p=0.00).

The last dimension, “Reputation of the Department & Job Opportunities” is more important for *Law, Health Sciences and Engineering* and less important for *Science, Linguistic,* and *Theology* (mean_L=4.52, mean_H=4.34; mean_E=4.24, mean_{SC}=3.88 mean_{LN}=3.92, mean_{TH}=3.97, Welch test=12.58, Brown-Forsythe test= 9.36, p=0.00).

The summary of all the statistical analyses can be found in Table 10.

Table 10: Summary of the Statistical Analyses: Key Determinants of University and Program Choice of Students

	Gender	Language of Instruction	Education Type	Academic Unit	Study Area
Dimensions of University Preference Criteria					
Social & Sports Activities	n.s.	T > FL	II > I	S = VS > F	VT > L = TH
International Recognition & Research Opportunities	n.s.	T > FL	n.s.	n.s.	n.s.
Reputation of the University	n.s.	T > FL	II > I	n.s.	TH = ED = S > E
Family & Friends	n.s.	T > FL	II > I	VS > F = S	VT > E = LN = H = SC, ED, S
State University & Low Tuition	n.s.	T > FL	II > I	n.s.	E < ED = L = TH = S, VT
Dimensions of Program Preference Criteria					
Area of Interest	n.s.	n.s.	n.s.	n.s.	L > VT = S = H = ED; LN > S
Research Opportunities	n.s.	T > FL	n.s.	VS > F > S	VT = SC = H > S = ED = LN
Score, Family & Friends	n.s.	T > FL	II > I	VS > F = S	VT = H = L > E = LN = SC = S
Reputation of the Dept. & Job Opportunities	n.s.	FL > T	n.s.	n.s.	L = H = E > SC = LN = TH

T = Turkish, FL = Foreign Language; I = Regular education, II = Evening education; F = Faculty, S = School, VS = Vocational School; ED = Education, SC = Science, LN = Linguistics, L = Law, TH = Theology, VT = Vocational and Technical Education, E = Engineering, H = Health Sciences, S = Social, Human and Administrative Sciences; n.s. = statistically not significant

IV. CONCLUSION AND DISCUSSION

This research was conducted to investigate selection criteria students use to evaluate higher education institutions. Therefore two instruments, university preference criteria questionnaire, and program preference criteria questionnaire were developed. As a result of the analyses, five dimension university preference criteria questionnaire, and four dimension program preference criteria questionnaire were found out to be both reliable, and valid. Dimensions of the university preference criteria were named as “Social & Sports Activities,” “International Recognition & Research Opportunities,” “Reputation of the University,” “Family & Friends,” “State University & Low Tuition,” and dimensions of the program preference criteria were named as “Area of Interest,” “Research Opportunities,” “Score, Family & Friends,” and “Reputation of the Department & Job Opportunities.” These factors were in line with the previous education literature. However so far the program selection is not analyzed separately, but as a part of the university preference criteria. Therefore, in this study reputation and the research opportunities of the university, and the program are found as distinct dimensions. In foreign countries, “family legacy” is another selection criterion [9] yet in our study, this item was deleted. This may be an indication that there is no tradition of selecting the same university as family members in Turkey since similar result was found in Yurtkoru and Ağaoğlu research as well [16]. It was interesting to note, despite the fact “geographic location” is one of the key criteria in international studies [3,4,8,9] and “place & convenience” was one of the dimensions of university preference criteria in Turkey [15,16] in this study no dimension related to location was found. This may be parallel to another survey finding where only 5% of students said convenience of the campus was an important factor [27].

When ratings given to criteria were compared, it was found that “State University & Low Tuition” was the most important criteria used by the students and the least used criterion was the influence of “Family & Friends” in selecting a university. Cost and tuition being an important criterion is again parallel finding with literature [8]. A study conducted on private universities in Izmir, Turkey to determine the order of preference on group of specified criteria, also indicated cost was the most important selection measure [28]. Consequently, we can say cost and low tuition fees is not an important factor for private universities alone but also the most important reason why a state university is chosen. This criterion was followed by “Reputation of the University.” “Social & Sports Activities” which is a dimension higher education institutions, especially the private ones, like to express in their promotions was not found to be an important criterion.

When the program preference criteria were investigated, it was found that “Area of Interest” was the

most important criteria used by the students and the least used criteria for program preference was found as “Score, Family and Friends.” Undergraduate non-completion has been attributed to poor decisions on institutional choice [1] therefore, it is pleasing to see the one of the most influential criteria was students’ area of interest. Students stating that they make their own decisions and they are not affected by third parties are again an affirmative finding for the higher education institutions. Yet surveys suggest that students are badly informed about programs they apply [1] and it is likely that potential students base their evaluation on a limited number of key criteria as opposed to looking at whole university offerings [5]; and decisions made by poor information may lead to “worst fit” instead of “best fit” to students’ interests and ambitions. University entrance exams’ score was a part of the “Score, Family and Friends” dimension, hence was not considered an important factor by the students. Yet this finding was contradictory to a survey conducted by one of the major newspapers in Turkey on 1532 university students [27]. The survey results indicated that 50% of the students made their selections only because their score was enough to enroll to that higher education. This difference may be due to the fact that in one study university preference was asked and in the other the program preference. Students may be more selective on their program of study and not as much on the higher education institution.

We further analyzed differences in criteria used by the students with respect to their study areas, academic units, education type, language of instruction and genders. Contrary to expectation no significant differences found according to gender however, there were significant differences in all other variables.

Interestingly students, who were enrolled to programs where the language of instruction was in foreign language found “Reputation of the Department & Job Opportunities” more important in their choice than students who were enrolled to programs where the language of instruction in Turkish. In all other dimensions, except “Area of Interest” which was not significant, students in Turkish medium programs perceived all criteria more important in their decisions. Since companies consider being a graduate from a university or program where teaching medium is in a foreign language as a desired quality, students ambitious in job opportunities in multinational companies may use this criterion more than others.

When we compared the dimensions of preference criteria by students’ education type, we found that except for the “International Recognition & Research Opportunities” which is insignificant, students enrolled to evening education finds all other dimensions of university preference criteria more important in their university choices. It appears that students need to evaluate criteria more deeply in selecting a university with an evening

education. When we analyzed the program preference criteria by education type, only significant result was “Score, Family & Friends” which was again more important for students enrolled to evening education in program choice. If a student is not working in daytime, choosing an evening education program where the tuitions are higher may be due to university entrance exam score as students are replaced to these programs with lower scores than regular programs.

There were also significant differences in importance given to “Social & Sport Activities” and “Friends & Family” in university preference criteria by academic units. Results revealed that students enrolled to schools and vocational schools gives “Social & Sport Activities” more importance and students enrolled to vocational schools gives “Friends & Family” more importance in their university choices. In program preference, “Research Opportunities” was not as much important to students enrolled to schools as students enrolled to faculties and vocational schools and “Score, Family & Friends” was a more important criterion for students enrolled to vocational schools.

When we performed analyses to test the differences in importance given to preference criteria by students in various study areas we found that except for “International Recognition & Research Opportunities” all dimensions were significant. The results indicated “Reputation of the University” was more important for students enrolled to study areas; Theology, Education and Social, Human and Administrative Sciences than Engineering and “Family & Friends” was more important for students enrolled to Vocational and Technical Education. When dimensions for program preferences were analyzed, it is found that “Area of Interest” was a more important criterion for Law and Linguistics students. “Research Opportunities” was equally important for Vocational and Technical Education, Science and Health Sciences and students of these 3 study areas found “Research Opportunities” more important. “Score, Family & Friends” was perceived equally by Vocational and Technical Education, Theology, and Law and had more importance than students of study areas Engineering, Linguistics, Science and Social, Human and Administrative Sciences. The last dimension, “Reputation of the Department & Job Opportunities” was more important for Law, Health Sciences, and Engineering and less important for Science, Linguistic, and Theology students. These preference criteria may be helpful for universities while they publicize information to candidates. Particularly the differences in study areas may be important in customizing the promotions for different areas instead of using similar materials for the overall university.

Finally, our sample size was adequate, but research was conducted only in one state university, which limits generalizability of findings. Repeating the study in

different universities and in private universities as well may give more insights about the students’ preference criteria and would facilitate the generalization of our results. In addition, this study only considered new admission students. Therefore, even though we obtained information about preference criteria, we know neither these criteria led students to be placed to programs that fit to their ideals, nor enrolled students fit to programs’ required qualifications.

REFERENCES

- [1]. Briggs, S. & Wilson, A. (2007). Which university? A study of the influence of cost and information factors on Scottish undergraduate choice, *Journal of Higher Education Policy and Management*, 29(1), 57-72.
- [2]. Daily, C. M., Farewell, S. & Kumar, G. (2010). Factors Influencing the University Selection of International Students, *Academy of Educational Leadership Journal*, 14(3), 59-75.
- [3]. Hagel, P. & Shaw, R. (2008). The Influence of Delivery Mode on Consumer Choice of University, *European Advances in Consumer Research*, 8, 531-536.
- [4]. Vaughn, R., Pitlik J. & Hansotia, B. (1978). Understanding University Choice: A Multi-Attribute Approach, *Advances in Consumer Research*, 5(1), 26-31.
- [5]. Abubakar, B., Shanka, T. & Muuka, G. N. (2010). Tertiary education: an investigation of location selection criteria and preferences by international students – The case of two Australian universities, *Journal of Marketing for Higher Education*, 20(1), 49-68.
- [6]. Binsardi, A., & Ekwulugo, F. (2003). International marketing of British education research on the students’ perception and the UK market penetration. *Marketing Intelligence and Planning*, 21(5), 318–327.
- [7]. Patton, H.L. (2000). How administrators can influence student university selection criteria. *Higher Education in Europe*, 15(3), 345-350.
- [8]. Montgomery, M. (2002). A nested logit model of the choice of a graduate business school, *Economics of Education Review*, 21, 471-480.
- [9]. Yugo, J .E. & Reeve, C. L. (2007). Understanding Students’ University Educational Image and Its Role in College Choice, *Psi Chi Journal of Undergraduate Research*, 12(1), 9-17.
- [10]. OSYM Statistics (2001). Retrieved June 12, 2012 from http://www.osym.gov.tr/dosya/1-43008/h/1ogrencisayilari_ozettablopdf.pdf
- [11]. OSYM Statistics (2011). Retrieved June 12, 2012 from <http://osym.gov.tr/belge/1-12654/2010-2011-ogretim-yili-yuksekokretim-istatistikleri.html>.
- [12]. Yükseköğretim Kurumu-YÖK (2007). *Türkiye’nin Yükseköğretim Stratejisi*. Retrieved Jan 8, 2011 from <http://www.yok.gov.tr/content/view/557/238/>
- [13]. Yükseköğretim Kurumu-YÖK (2012). Retrieved June 12, 2012 from <http://www.yok.gov.tr/content/view/527/222/lang.tr/www.yok.gov.tr>

- [14]. Higher Education Council Student Selection and Placement Center (ÖSYM). (2006). Selection and placement of students in higher education institutions in Turkey. Retrieved Feb 11, 2011 from <http://www.osym.gov.tr/dosya/1-56877/h/aboutosym.pdf>.
- [15]. Ağaoğlu, M. & Yurtkoru, E.S. (2011). Öğrencilerin Üniversite Eğitiminden Beklentileri ve Tercih Ölçütlerine İlişkin Veri Madenciliği Uygulaması. *Proceedings of International Higher Education Congress: New Trends and Issues*, Istanbul, Turkey.
- [16]. Yurtkoru, E.S. & Ağaoğlu, M. (2011). University Preference Criteria. *Proceedings of New Developments in Theory and Applications of Statistics: An International Conference in Memory of Professor Moti Lal Tiku*, Ankara, Turkey. 78-85.
- [17]. Lattin, J., Carroll, J.D. & Green, E.P. (2003). *Analyzing Multivariate Data*, Pacific Grove, CA: Brooks/Cole Thomson Learning.
- [18]. Hair Jr., F.J., Black, C.W., Babin, J.B. & Anderson, E.R. (2010). *Multivariate Data Analysis 7th Ed.*, Upper Saddle River, NJ: Prentice Hall Inc.
- [19]. Sharma, S. (1996). *Applied Multivariate Statistical Analysis*, New York, NY: John Wiley and Sons, Inc.
- [20]. Netemeyer, R.G., Bearden, W.O. & Sharma, S. (2003). *Scaling Procedures: Issues and Applications*, Thousand Oaks, CA: Sage Publication.
- [21]. Nunnally, J. (1978). *Psychometric theory 2nd Ed.*, New York, NY: McGraw-Hill. cited in DeVellis, F.R. (2003). *Scale Development: Theory and Applications*, Thousand Oaks, CA: Sage Publication.
- [22]. DeVellis, F.R. (2003). *Scale Development: Theory and Applications*, Thousand Oaks, CA: Sage Publication.
- [23]. Hoyle, R.H. (1995). *Structural Equation Modeling: Concepts, Issues, and Applications*, Thousand Oaks, CA: Sage Publication.
- [24]. Bagozzi R.P. & Yi, Y. (1988) On the Evaluation of Structural Equation Models, *Journal of the Academy of Marketing Science*, 16(1), 74-94.
- [25]. Fornell, C. & Larcker, F.D. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error, *Journal of Marketing Research*, 18, 39-50.
- [26]. Anderson, J.C. & Gerbing, D.W. (1988). Structural equation Modeling in Practice: A Review and Recommended Two-Step Approach, *Psychological Bulletin*, 103, 411-423.
- [27]. hurriyetegitim.com (2011). Üniversite Memnuniyet Anketi. Retrieved June 12, 2012 from <http://www.hurriyetegitim.com/haberler/01.03.2011/universite-tercihinde-en-onemli-kriter-puan.aspx>
- [28]. Özgüven, N. (2011). Vakıf üniversitesi tercihinin analitik hiyerarşi süreci ile belirlenmesi. *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi*. 30, 279-290.



Mustafa AĞAOĞLU

agaoglu@marmara.edu.tr

He has a Ph.D. in Informatics at Marmara University. He is an Assistant Professor of Computer Science Engineering at Marmara University. His research areas are databases, data mining, optimization, and higher education.



E. Serra YURTKORU

syurtkoru@marmara.edu.tr

She has a Ph.D. of Business Administration at Marmara University. She is an Associate Professor of Quantitative Methods at Marmara University. Her research areas are multivariate statistics, datamining, leadership, consumer behavior, and higher education.